



US Army Corps  
of Engineers  
HUNTSVILLE DIVISION

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Defense Environmental Restoration Program  
for  
Formerly Used Defense Sites

Ordnance and Explosive Waste  
Chemical Warfare Materials

## **ARCHIVES SEARCH REPORT FINDINGS**

CENTRAL OREGON AIR TO AIR GUNNERY  
RANGE MILITARY RESERVATION

Lake County, Oregon

Project No. F10OR017001

JULY 1995

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Prepared by  
US ARMY CORPS OF ENGINEERS  
ST. LOUIS DISTRICT

ORDNANCE AND EXPLOSIVE WASTE  
CHEMICAL WARFARE MATERIALS  
ARCHIVES SEARCH REPORT  
FINDINGS  
FOR  
CENTRAL OREGON AIR TO AIR  
GUNNERY RANGE MILITARY RESERVATION  
Lake County, Oregon

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## 1.0 Introduction

### 1.1 Authority

In **1980**, Congress enacted the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) **42 USC 9601 et seq.** Ordnance and explosive wastes **are** included in the CERCLA definition of pollutants and contaminants that require a remedial response.

In **1983**, the Environmental Restoration Defense Account (ERDA) was established by Public Law **98-212**. **This** Congressionally-directed fund was to be used for environmental restoration at Department of Defense (DOD) active installations and formerly used properties. The DOD designated the Army **as** the sole manager for environmental restoration at closed installations and formerly used properties. The Secretary of the Army assigned this mission to the Corps of Engineers (USACE) in **1984**.

The **1986** Superfund Amendments and Reauthorization Act (**SARA**) amended **certain aspects** of CERCLA, some of which directly related to OEW contamination. Chapter 160 of the SARA established the Defense Environmental Restoration **Program** (DERP). One of the goals specified for the DERP is "correction of environmental damage (such **as** detection and disposal of unexploded ordnance) which creates **an** imminent and substantial endangerment to the public health or welfare or to the environment".

The DERP requires that a CERCLA response action be undertaken whenever such "imminent and substantial endangerment" is found at:

- A. A facility or site that is owned by, leased to, or otherwise possessed by the United States and under the jurisdiction of the Secretary of Defense.
- B. A facility or site ~~that~~ was under the jurisdiction of the Secretary of Defense and owned by, leased to, or otherwise possessed by the United States ~~at~~ the time of actions leading to contamination.
- C. A vessel owned or operated by the Department of Defense.

The National Contingency Plan (NCP) was established by the Clean Water Act of **1972**. The NCP **has** been revised and broadened several times since then. Its purpose is **to** provide the organizational structure and procedures for remedial actions to be taken in response to the presence of hazardous substances, pollutants, and contaminants at a site. Section 105 of the **1980** CERCLA states that the NCP shall apply to all response actions taken **as** a result of CERCLA requirements.

The March **1990** National Oil and Hazardous Substances Pollution Contingency Plan given in 40 CFR part 300 is the latest version of the NCP. Paragraph **300.120** states that "DOD will be the removal response authority with respect to incidents involving DOD military weapons and munitions under the jurisdiction, custody, and control of DOD."

On April 5, 1990, U.S. Army Engineer Division, Huntsville (USAEDH) was designated as the USACE Mandatory Center of Expertise (MCX) and Design Center for Ordnance and Explosive Waste (OEW). As the MCX and Design Center for OEW, USAEDH is responsible for the design and successful implementation of all Department of the Army OEW remediations required by CERCLA. USAEDH will also design and implement OEW remediation programs for other branches of the Department of Defense when requested. In cooperation with the Huntsville Division, the U.S. Army Corps of Engineers St. Louis District has been assigned the task of preparing Archives Search Reports for those Formerly Used Defense Sites (FUDS) suspected of ordnance and explosive waste (OEW) and chemical warfare materials (CWM) contamination.

## 1.2 Subject

The Central Oregon Air-to-Air Gunnery Range **Military** Reservation (also known as the Central Oregon Aerial Gunnery Range), located in Lake County, Oregon, was used as an aerial gunnery range during World War II.

## 1.3 Purpose

This Archives Search Report (ASR) compiles information obtained through historical research at various archives and records holding facilities, interviews with **persons** associated with the site or its operations, and personal visits to the site. All efforts were directed towards determining possible **use** or disposal of OEW on the site. Particular emphasis was placed on establishing the **type** of munitions, quantities and areas of disposal. Information obtained during this process was used in developing recommendations for further actions at the site.

## 1.4 Scope

The entire site ~~of~~ the former gunnery range, consisting ~~of~~ 795,056.77 acres, was evaluated in assessing the potential for OEW contamination. It is designated as DERP-FUDS Site Number F10OR017000 (OEW Project No. F10OR017001).

This report presents the history of the site, description and characterization of the immediate surrounding area, real estate ownership information, findings of a visual field survey, and OEW site analysis, including an evaluation of potential ordnance contamination. A separate **Executive Summary** supplements these ASR FINDINGS and furnishes the CONCLUSIONS and RECOMMENDATIONS.

## 2.0 Previous Site Investigations

### 2.1 Corps of Engineers Documents

Under the Defense Environmental Restoration Program (DERP), the Fort **Worth** District prepared a Findings and Determination of Eligibility (FDE), for the subject Central Oregon Air to Air Gunnery Range, ~~dated~~ 1 October **1993**. The FDE proposes an OEW project at the site of ~~this~~ former aerial gunnery range. The District's review of ~~real~~ estate records did not reveal any restrictions, restoration, or recapture clauses. The report determined that the site was eligible for the Defense Environmental Restoration Program for Formerly ~~Used~~ Defense Sites under 10 U.S.C. 2701 et seq.

Records indicate that the site was cleared of any OEW prior to termination of the leases and use permit, live ammunition (.50 caliber belts) and expended 20mm rounds have been found on the property. Additionally, remnants of the targets remain on the site. Though a RAC ~~of~~ 5 was derived for the site, the District recommended that the range be **further** investigated. A copy of the FDE is included at Appendix D-1.

### 2.2 Other Reports

There were no other investigation ~~reports~~ found for ~~this~~ site.

### 3.0 Site and Site Area Description

#### 3.1 Land Usage

##### 3.1.1 Location

Located in Lake County, Oregon, the site is approximately 35 miles north of the City of Lakeview and 48 miles southwest of Burns. According to the INPR, the range is bound by US Hwy 395 on the east, State Hwy 31 on the south and west, and a County road on the north.

##### 3.1.2 Past Use

The Army utilized the site for aerial gunnery target practice. Prior to that time it was open desert.

##### 3.1.3 Present Use

The site is currently an open desert range.

#### 3.2 Climatic Data

Normal airmasses move into the area from the Pacific Ocean. This air gives up most of its moisture after crossing the Coastal Range and then the Cascade Mountains. This leaves very dry air which flows into the Central Oregon plateau. It has a dry season and warm temperatures in summer, a cold and slightly wetter winter, and a wide range in temperature.

Average annual precipitation is about 10 inches a year. Approximately 29 percent of this annual total occurs during the period December through February; 27 percent March through May; 19 percent in June through August, and 25 percent September through November. Thunderstorms have occurred in the area every month of the year, but are most likely late in spring and in summer.

Relative humidity ranges from about 25 percent in mid-afternoon to 80 percent during the early hours of the day in the warmest and driest months. In winter it ranges from 75 percent in mid-afternoon to around 80 percent or higher early in the morning.

Average snowfall for the area is about 17 inches. There are only 6 to 8 days per year when an inch or more of snow falls. It seldom remains on the ground for more than a few days. Small hail commonly occurs a few times each winter.

During the 5-month period of November through March, 70 to 80 per cent of the sky is covered with clouds on an average day. In July, however, there is only an average of 15 per cent cloud cover.

**An** actual tornado has never been officially recorded in the survey area. However, dust storms sometimes build up to a height of several hundred feet late in spring and summer.

Climatological data for the site area are summarized in TABLE 3-1. Data were collected at the National Weather Service meteorological station at Burns, Oregon which is in Harney County, just east of Lake County.

**CLIMATOLOGICAL DATA FOR  
BURNS, OREGON  
TABLE 3-1**

Month	Temperature		Precipitation Average (Inches)	Wind*	
	Average Minimum (°F)	Average Maximum (°F)		Average Speed Miles/Hour	Average Direction
January	15.0	35.4	0.99	6.2	*.*
February	20.4	41.5	0.76	6.3	*.*
March	24.2	47.9	1.01	7.6	*.*
April	30.2	58.1	0.65	8.7	*.*
May	37.8	66.5	0.98	8.6	*.*
June	44.1	73.9	0.83	7.9	*.*
July	51.1	85.6	0.40	7.7	*.*
August	48.8	83.4	0.66	7.1	*.*
September	40.9	75.4	0.56	7.0	*.*
October	32.0	62.6	0.72	6.4	*.*
November	24.3	47.2	1.25	5.4	*.*
December	18.3	37.5	1.15	5.8	*.*
Average	32.3	59.6	9.96	7.0	*.*

\*.\* Prevailing wind direction unavailable

### 3.3 Geology and Soils

The Central Oregon Air to Air Gunnery Range falls within the Walla Walla Plateaus section of the Columbia Plateaus Physiographic province. The bedrock in the site area consists almost entirely of basalt lava flows. The lava plateaus are interspersed with many rhyolitic deposits and rhyolite volcanic structures. There are also some deposits of light colored volcanic ash.

The low topographical features **are** sand dunes, alkali lakes, and shorelines of ice-age lakes. The elevated features are prominently volcanic in origin. Another type of elevated feature are the ash-ring volcano. These structures were formed by more violent eruptions that were



assisted by steam. The remaining structure was then cut by wave erosion of the ice-age lakes and left standing as islands in the level lava plateaus.

In the southern half, the site covers an area of extensive faulting. The northwest-southeast trending faults have been softened by erosion and are most visible by air. These faults are collectively named the Brothers fault and there are at least 25 faults to the south of the site. Everywhere south of the Brothers fault zone the lava plateau is broken into big fault block mountain ranges and valleys; north of it the lava plateau is still relatively intact and unbroken by faulting (Alt and Hyndman 1990).

### 3.3.1 Soils

Where there are soils present in the site area, they are very thin. For the most part, the surface is composed of various outcropping rocks, mostly basalt. In some areas, fault block valley floors filled with muddy sediments that were washed into them from neighboring mountains. These Miocene age fills and sediments are mostly gravelly and silty sand in nature.

## 3.4 Hydrology

### 3.4.1 Surface Water

The Central Oregon Air to Air Gunnery Range is located in south-central Oregon in Lake County. The site is in an area of high desert open range adjacent to Alkali Lake which is a dry lake bed.

### 3.4.2 Groundwater

The rainfall does not develop connected stream systems. When it does rain, muddy runoff pours off the mountains and into the lowest part of the valleys where the majority of the water ponds and dries, rather than seeping to a ground water reservoir. Towards the western edge of the site, the region is semi-arid. The region provides just enough rainfall to allow lakes to remain full while not allowing any significant drainageways to form (Alt and Hyndman 1990). There is very little engineering information available on the groundwater present in this location.

## 3.5 Ecology

The information on the endangered and threatened species for this site has been provided by the U.S. Fish and Wildlife Service and the Oregon Department of Fish and Wildlife.

The U.S. Fish and Wildlife Service has indicated that the following Federally protected species may be found in the vicinity of the Central Oregon Air to Air Gunnery Range: Columbian white-tailed deer (Odocoileus virginianus leucurus), endangered; white-footed vole (Arborimus albipes), candidate; Pacific western big-eared bat (Plecotus townsendii

townsendii), candidate; bald eagle (Haliaeetus leucocephalus), threatened; brown pelican (pelecanus occidentalis), endangered; marbled murrelet (Brachyramphus marmoratus), threatened; Snake River chinook salmon (Oncorhynchus tshawytscha), threatened; Snake River sockeye salmon (Oncorhynchus nerka), endangered; Oregon silverspot butterfly (Speyeria zerene hippolyta), threatened; northern red-legged frog (Rana aurora aurora), candidate; **tall** bugbane (Cimicifuga elata), candidate; and Howell's montia (Montia howellii), candidate.

The Oregon Department of Fish and Wildlife provided comments on the following State threatened and endangered species: bull trout (Salvelinus confluentus), critical; cascades frog (Rana cascadae), critical; spotted frog (Rana uretiosa), critical; American peregrine falcon (Falco peregrinus), endangered; bald eagle, endangered; northern spotted owl (Strix occidentalis caurina), threatened; black-backed woodpecker (Picoides articus) critical; burrowing owl (Speotyto cunicularia), critical; ferruginous hawk (Buteo regalis), critical; flammulated owl (Otus flammeolus), critical; Lewis' woodpecker (Asyndesmus lewis), critical; northern goshawk (Accipiter gentilis), critical; pileated woodpecker (Dryocopus pileatus), critical; red-necked grebe (Podiceps grisegena), critical; three-toed woodpecker (Picoides tridactylus), critical; white-headed woodpecker (Dendrocopos albolarvatus), critical; wolverine (Gulo luscus), threatened; American martin (Martes americana), critical; and Pacific western big-eared bat, critical.

No additional information on the occurrence of rare or endangered species or natural communities is known at this time. **This** does not mean that other state or federally-listed species may not be present within the areas of interest. **An** on site inspection by appropriate state and federal personnel may be necessary to verify the presence, absence or location of listed species, or natural communities if remedial action is recommended **as** part of the final ASR.

### 3.6 Demographics of the Area

#### 3.6.1 Center of Activity

Central Oregon Air to Ground Gunnery Range is located near **the** City of Lakeview, Lake County, Oregon. This community has numerous centers of activity such **as** Abert Rim, **Fort Rock**, Schimnck Memorial Museum, and various parks located throughout the community.

#### 3.6.2 Population Density

City:	Lakeview	county:	Lake
Area:	NA	Area:	<b>8,251</b> sq.mi.
POP:	2,880	POP:	7,800
PD:	NA persons per sq.mi.	PD:	0.95 persons per sq.mi.

Population and area are based on the **U.S.** Department of Commerce, Bureau of **the** Census, 1990 statistics, and telephone interviews.

### 3.6.3 Business and Industry Profile

A review of both telephone interviews and County Business Patterns (1990) assisted in developing a business profile of the area. The City of Lakeview is not diversified. The largest employers are: MacFarland Door Manufacturing, Pacific Pine Products, Fremont Sawmill Co., Lakeview Lumber. The community supports **only** supports retail, service industries, and light industry.

### 3.6.4. Type of Housing

Housing in Lakeview is composed of both single and multi-family homes. There are approximately **3,434** housing units with a median value of **\$41,900**.

### 3.6.5 New Development in the Area

Development in the Lakeview area include residential dwellings, promote tourism, and manufacturing development.

### 3.6.6 Typical Cross-Section of Population

The ancestry in Lakeview is diverse. Approximately **92.7%** of the population is white, **0.1%** Black, **3.8%** Hispanic, **2.8%** American Indian or **Eskimo**, and **0.6%** Asian or Pacific Islander. The percent of those under the age of **18** is **27.1%**, over **65** years is **16.5%**. The median age is **36**. The work force, based on the number of establishments, of Lake County is broken down into the following: manufacturing, **7.8%**; agriculture, **3.6%**; trade and finance, **42.8%**; services, **29.7%**; others, **16.2%**.

## **4.0 HISTORICAL ORDNANCE USAGE**

### **4.1 Historical Site Summary**

In 1942, the **U.S.** Army acquired a total of approximately 797,422.41 acres of land for use as an **aerial** gunnery range. The Central Oregon **Air-to-Air** Gunnery Range (COGR) was "designated as an urgent national defense need" (**Bums Times Herald** 1942). Walla Walla Army **Air** Field was the main user of the site; however, a 1945 document shows Gowen AAF canceling their lease for the COGR (Colonel, **Air** Corps).

The former range is situated **48 miles** southwest of Bums and **35 miles** north of Lakeview, OR. It is bounded by Highway 395 on the east, **State** Highway 31 on the south and west, and a **Lake County road** on the north. The site served as an aerial gunnery range to include air to air training, air to ground practice, and it is possible that it may have been utilized to some extent for air-to-ground bombing purposes (Adjutant General 1946). A **History** of Walla Walla AAF states "air-to-ground gunnery missions to the Central Oregon Gunnery Range were and **still are** a daily occurrence" (Walla Walla 1944).

A portion of the former COGR occupies the dry bed of *Alkali* Lake. The Lake County Examiner stated in 1943 that "Instructors at the school for machine gunners are at Camp *Alkali*, and are instructing men in the use of **.50** calibre machine guns. Firing rockets from both ends of a field, two rows of anti-aircraft guns are stationed near the highway where they pepper away at the flying targets with tracer bullets." Troops participating in the Northwest Maneuvers of 1943 also conducted training on the COGR (**Bums Times Herald** 1943).

The Army declared the property surplus in June of 1947. In November of that same year, the Corps of Engineers informed the Department of the Interior that, "The lands have been examined and have been cleared of **all** explosives or explosive objects reasonably possible to detect by visual inspection." A copy of this letter is located at Appendix E.

A belt of live **.50** caliber ammunition was found in the northern part of the range in 1990. During a Corps of **Engineers** - Portland District site inspection of the range in 1993, expended 20mm and **.50** caliber rounds were found adjacent to the two berms (INPR). Representatives from the St. **Louis** District also located **.50** caliber rounds during a 24 May 1995 site visit.

Neither documentation nor evidence of CWM usage was found pertaining to the COGR. A Cultural Resource Inventory on **Alkali** Lake states "large quantities of debris from WWII training exercises are also evident throughout the basin."

## 4.2 Review of Historical Records

National Archives and Records Administration  
Suitland Branch  
4205 Suitland Road  
Suitland, MD 20409

RG 153 Records of the ~~Office~~ of Judge Advocate General  
Entry: Res. Files 1800-1950, Box 360

Washington National Record Center  
4205 Suitland Road  
Suitland, MD 20409

All record groups yielded no pertinent information.

National Archives  
8th and Pennsylvania  
Washington, D.C. 20408

All record groups yielded no ~~pertinent~~ information.

National Archives at College Park  
8201 Adelphi Rd  
College Park, MD 20740

RG 18 Records of the Army ~~Air~~ Forces  
~~Air~~ Adjutant General ~~Decimal~~ File: June 1944-46, 686 Okl-Rhode Island, Box  
2299, Folder, ~~Buildings~~ and Grounds, OR.

~~Center~~ for Military History  
1099 14th St. N.W.  
Washington, D.C. 20005-3404

Real estate ~~data~~.

Chemical and Biological Defense Agency Command Historical ~~Office~~  
AMSCB-CIH  
Aberdeen Proving Ground  
Edgewood, MD 21010

No pertinent ~~data~~.

**National Archives-Pacific Northwest Region  
6125 Sand Point Way N.E.  
Seattle, WA 98115**

RG 270 Records of the ~~War~~ Assets Administration  
Real **Property Case** Files: **Box 324**, Folder, moving and target range.

**Federal Record Center-Seattle  
6125 Sand Point Way N.E.  
Seattle, WA 98115**

Finding aid did not ~~indicate~~ any possibilities.

**USACOE-Seattle District  
4735 E. Marginal Way  
Seattle, WA 98124-2255**

Real estate ~~data~~, maps and dedudding information.

**National Personnel Record Center-Military Branch  
9700 Page Avenue  
St. Louis, MO 63132**

RG 18 Records of the **Army Air** Forces  
Series: **8-17-23-5-5, Box 3\23**, folder, **684** bombing and gunnery range.  
Series: **8-17-24-1-1, Box 22\23**, folder, **601.53** leases and loans/  
Series: **8-17-23-9-3, Box 14\23**, folder, **684** general.  
Series: **8-17-24-F-5 (AF-63), Box 21\23**, folder, target **and** bomb. rngs  
Series: **8-17-2-4-E-5, Box 18\23**, folder, driveways, highways and roads &  
abandonment of buildings.  
**Boxes 1, 10 & 11 of 23**

RG 342 Records of the ~~United States Air~~ Force Commands  
Series: **48-22-2-5, Box 1\1**, folder, target ranges

**Air Force Historical Research Agency  
600 Chennault C i l e  
Maxwell Air Force Base, AL 36112-6424**

**289.53-9-289.53-11, July 94-Oct 94, Box 5, History of Walla Walla AAF**

**Portland Historical Society  
1230 S.W. Park Avenue  
Portland, OR 97205**

~~Series~~ of newspaper ~~articles~~ ~~from~~ the Bend Bulletin and the Oregonian.

**Schmick Museum  
128 south East St  
Lakeview, OR 97630**

**No** information.

**Lake County Museum  
126 South East St.  
Lakeview, OR 97630**

**No** information.

**Lakeview Historical Society  
P.O. Box 48  
Lakeview, OR 97630**

No information.

**Lake County Examiner  
305 No. F Street  
Lakeview, OR 97630**

~~Articles~~ on ordnance discovery in ~~Christmas~~ Valley and training at Alkali Lake.

**Bureau of Land *Management*  
P.O. Box 151  
Lakeview, OR 97630**

Cultural Resource Inventory ~~on~~ the Alkali Lake ~~Bombing~~ Range.

**Lakeview Public ~~Library~~  
Center Street  
Lakeview, OR 97630**

No information.

**Burns Historical Society  
144 East E Street  
Burns, OR 97720**

No information.

**Burns Public Library  
East E. Street  
Burns, OR 97720**

Newspaper articles pertaining to the Central Oregon Air-to-Air Gunnery Range.

**Harney County Assessor  
450 N. Buena Vista  
Burns, OR 97720**

No information

**Bureau of Land Management  
1300 Northeast 44th Ave  
Portland, OR**

No information

**CASU Library  
St. Louis District corps of Engineers  
St. Louis, MO 63103**

Hoegh, Leo and Howard Doyle

**1946 *Timberwolf Tracks: The History of the 104th Infantry Division, 1942-45.*  
Washington Infantry Journal Press, Washington, D.C.**

#### **4.3 Summary of Interviews**

Interviews were conducted **by** telephone and in person, both prior to and during the site inspection. The primary purpose of **these** interviews was to make **initial** contact with individuals knowledgeable of the site and **to** coordinate follow-up visits during the site inspection phase of **this** ASR's **preparation**. A list of persons interviewed is included at **Appendix H**. **Any** pertinent information derived from these discussions is covered within the context of **this** report.



#### 4.4 Interpretation of Aerial Photography

##### 4.4.1 Photo Analysis

Photo interpretation and land-use analysis was **performed** using the following aerial photography:

<b><u>Photo Date</u></b>	<b><u>Approx. Scale</u></b>	<b><u>Source</u></b>	<b><u>Frame ID#</u></b>
28 Jun 1954	1" = 1,667'	ASCS	4 thru 11 9 thru 17 21 thru <b>28</b> 159 thru 166 174 thru 181

Photos were referenced using the following two **USGS 7.5'** topographic quadrangles (both **are** provisional editions 1984):

Alkali Buttes, OR  
Alkali Lake, OR

Photography **from** 1954 does not show any evidence of ordnance or explosives in site **areas**. There is a **area labeled as** a chemical disposal **on the** Alkali Lake quadrangle. **This area** is located at the southwest side of the dry lake. No **areas** around **this site** looked **disturbed**. The site area consists of sand dunes and a dry lake bed. The terrain is hilly and somewhat rugged around **the** northwestern **part** of the lake, while other **areas** to the southeast are flat. Vegetation **consists** of low lying scrub.

##### 4.4.2 Map Analysis

Map analysis was **performed using two USGS 7.5'** topographic quadrangles (provisional editions 1984). They **are as** follows:

Alkali Buttes, OR  
Alkali Lake, OR

The two quads show both planimetric and topographic features. The **planimetric** features mainly consist of hard and loose surface roads, **tracks** and **trails** and **small** miscellaneous cultural features. Planimetric features for the site **areas are limited** consisting of just a few roads and a chemical **disposal area**. Topographic features for both the **site area** and the quads **are** few. **Dry** lakes and buttes **are** prevalent. Relief **varies from** flat too rugged. There **are** Occasional **perennial** drains **scattered** throughout.

## 5.0 Real Estate

### 5.1 Confirmed DOD Ownership

The FDE cited in section 2.1 of this ASR states that the Army acquired 737,000 acres of public domain and 58,056.77 acres of lease lands for the Central Oregon Air to Air Gunnery Range between 1942 and 1943. The site was declared excess in June 1947, the public lands retransferred in November 1947, and the leases canceled in January 1948. The site totalled 795,056.77 acres.

None of the real estate documents examined contained ordnance and explosive waste related land use restrictions. While a formal certificate of clearance was not located, a 1947 *Corps* of Engineers letter **stated** that the land had been cleared of all explosives (Appendix E).

### 5.2 Potential DOD Ownership

No information indicating DOD ownership of any lands other than those mentioned above was uncovered during the archive search.

### 5.3 Significant Past Ownership other than DOD

Research did not reveal any past ownerships other than DOD that would have contributed to OEW contamination.

### 5.4 Present Ownership

The vast majority of the site is presently open public land administered by the Department of the Interior and managed by the Bureau of Land Management. There are some individual private holdings within the site boundaries.

## 6.0 Site Inspection

The subject **was** conducted May 25, 1995 by the following personnel of the St. Louis District:

Dennis W. Gilmore	Project Manager
Randy Fraser	Safety <del>Specialist</del>
M. Kevin McCaffrey	QASAS
C. John Daly	Historian

In that **no** information on the locations of the former targets was uncovered during the archive search, the focus of the site inspection **was** on the two locations identified in the **INPR as** "probable target mounds." Additionally, a map and aerial photo reconnaissance of the site did not provide any other **potential** target mounds.

At each of the two "probable" target sites, **.50** cal rounds were found. The center of the aerial target and the location of the **.50** caliber rounds is identified **as: North 42° 58' 52.1"**, West 120° 03' 08.0". **This** was the **only** ordnance observed which confirms the areas **as** the former target locations.

The southern mound is generally triangular in shape, measuring ten to **fifteen** feet high, covering an **area** of approximately 433,000 square feet. This mound was obviously constructed. The remnants of seven wood structures, presumably targets, are located on the mound, in an east-west line. The layout seems to represent that of a convoy.

The northern location does not appear to be a mound. It is **situated on a** considerably smaller, natural appearing **rise**. Some **wood**, possibly used for the target, was observed at **this** site.

Located adjacent to, and south of, the southern berm is a fenced area identified by signs **as** a hazardous waste disposal site. Through our research, it has been determined that the disposal of hazardous materials at this location by a private party **occurred** subsequent to DOD's use of the site. The State of Oregon **has** assumed responsibility for the monitoring and eventual remediation of **this** HTW disposal **area**. It is managed through the Oregon Department of Environmental Quality. A photograph of the fenced **area** and sign is located in Appendix I.

## 7.0 Evaluation of Ordnance Presence

Based on the extensive archive searches performed, and the results of the site investigation, there exists **OEW** in the form of **small arms** rounds and brass.

The review of historical records provided no information on the locations of the former targets. Based on the expansive **area** to be investigated, the focus of the investigation efforts was to examine the two locations identified in the INPR as "probable target mounds" and to conduct a map and **aerial** photo **reconnaissance** of the site to identify **any** other potential target mounds.

Of the two target locations outlined in the **INPR**, the southern one seemed **more** appropriate because of its proximity **to** Alkali Lake, **a** easily identifiable terrain feature. **This** prompted the team to examine the lands in the vicinity of Summer Lake on the southwestern boundary of the site, with negative results.

During the conduct of the site inspection, each of the reported target **areas** were examined. At each of the sites, **.50** caliber rounds were found. **This was** the only ordnance observed, which apparently confirms the **areas as** the former target locations.

A hazardous waste disposal site is located adjacent **to**, and south of, the southern berm. The area is fenced and identified by signs. Through our research, it has been determine that the disposal of hazardous materials at **this** location occurred subsequent **to** DOD's **use** of the site. The **State** of Oregon **has** assumed responsibility for **this** inactive HTW **disposal** area.

## 8.0 TECHNICAL DATA OF ORDNANCE AND EXPLOSIVES

### 8.1 Ordnance Related Mission

Central Oregon **Air** to Air Gunnery Range **was** used extensively for aerial gunnery training with small arms ammunition. The caliber **.50** ball ammunition found in the **vicinity** of the targets support this finding. Ground troops also used this range for **ground-to-air** training, firing caliber **.50** machine guns at aerial targets. No remains of aerial targets were found.

**Reports** indicated the possibility of 20mm ammunition; none **were** found during the site visit. There is also a possibility that the range may have **been** used **as** a bombing range, but **no** evidence **was** found to support such activity. Included is a description of caliber **.50** ammunition and an 20mm, High-Explosive Incendiary, not necessarily **the type** used, but the most **hazardous**.

Additional technical information including illustrations from TM 9-1901-1, Ammunition for Aircraft Guns, dated December 1957, is located in Appendix **C**.

### 8.2 Description of Ordnance

#### 8.2.1 Cartridge, Caliber **.50**

The cartridge, Caliber **.50** is a small arms round used in Machine Guns, Caliber **.50.**, **M2** and **M85**. This **type** of ammunition is depicted by the color of the bullet and includes; **Ball**, Tracer, Incendiary, Armor Piercing, Armor Piercing Incendiary with or without tracer, Spotter Tracer, and Blank. Tracers **were** found at the target site.

#### 8.2.2 Cartridge, 20mm

The complete round, 20mm is used in an **M3** automatic aircraft **cannon**. The filler is identified by its color and markings. **Types** include, Ball, High-Explosive Incendiary, Armor Piercing Tracer, Incendiary, and Practice.

### 8.3 Reference

TM 9-1901-1, Ammunition for Aircraft Guns, dtd December 1957

## **9.0 Evaluation of Other Site Information**

No other environmental areas of concern, attributable to DOD, were discovered during the archive search.

The ~~State~~ of Oregon ~~has~~ assumed responsibility for an inactive **HTW** site within the project boundaries. It is fenced and identified by warning signs. Further information on this site ~~can~~ be obtained by calling the Oregon Department of Environmental Quality (**See Photo #5**, Appendix I).

**APPENDIX A**  
**REFERENCES**

ORDNANCE AND EXPLOSIVE WASTE  
CHEMICAL WARFARE MATERIALS  
ARCHIVES SEARCH REPORT  
FINDINGS  
FOR  
CENTRAL OREGON AIR TO AIR  
GUNNERY RANGE MILITARY RESERVATION  
Lake County, Oregon

Project Number F10OR017001

APPENDIX A - REFERENCES

A1 INPR REFERENCES

U.S. Army Corps of Engineers

- 1993 Inventory Project Report: Central Oregon Air-to-Air Gunnery Range, Portland District Corps of Engineers.

A2 HISTORICAL REFERENCES

Adjutant General

- 1946 Declaration of Excess of Leased Property, dated December 16, 1946. Real Estate Division, U.S. Army Corps of Engineers, Portland District.

Bunton, Hugh

- 1984 Alkali Lake Bombing Range: Class III Cultural Resource Inventory. Bureau of Land Management, Lakeview District, Lakeview, OR.

Burns Times Herald

- 1943 U.S. Army to Maneuver on Range Land, 28 May:1 #27. Burns Public Library, Burns, OR.

Colonel, Air Corps

- 1945 Cancellation of Leases and Permits, dated November 5, 1945. Record Group 18, Series 8-17-2-4-E-5, Box 18/23, Folder 602.1 (Abandonment of Buildings). National Personnel Record Center, St. Louis, MO.

Colonel, Corps of Engineers

- 1947 Letter from Peter Goerz to Director, Department of Interior, dated November 24, 1947. Real Estate Division, U.S. Army Corps of Engineers, Seattle District.



Walla Walla Army Air Field

1944 289.53-9 to 289.53-11, Box 3. Historical Research Center, Maxwell Air Force Base.

### **A3 REFERENCES FOR GEOLOGY AND SOILS**

Alt, David D. and Hyndman, Donald W.

1990 *Roadside Geology of Oregon*. Mountain Press Publishing Co., Missoula, Montana.

### **A4 DEMOGRAPHIC REFERENCES**

Lakeview Chamber of Commerce (503) 947-6040

U.S. Department of Commerce. Bureau of the Census. OREGON. 1990.

**APPENDIX B**  
**GLOSSARY AND ACRONYMS**

**ORDNANCE AND EXPLOSIVE WASTE  
CHEMICAL WARFARE MATERIALS  
ARCHIVES SEARCH REPORT  
FINDINGS  
FOR  
CENTRAL OREGON AIR TO AIR  
GUNNERY RANGE MILITARY RESERVATION  
Lake County, Oregon**

**Project Number F10OR017001**

**APPENDIX B -- GLOSSARY AND ACRONYMS**

AAF	Army Air Field
AA	Anti-Aircraft
AEC	Army Environmental Center
AGO	Adjutant General's Office
AP	Armor Piercing
APDS	Armor Piercing Discarding Sabot
APERS	Antipersonnel
APT	Armor Piercing with Tracer
ASR	Archives Search Report
Aux	Auxiliary
BAR	Browning Automatic Rifle
BD	Base Detonating
BD/DR	Building Demolition/Debris Removal
BE	Base Ejection
BGR	Bombing and Gunnery Range
BLM	Bureau of Land Management
BRAC	Base Realignment And Closure
CADD	Computer-Aided Design/Drafting
Cal	Caliber
CBDA	Chemical and Biological Defense Agency
CBDCOM	Chemical and Biological Defense Command
CE	Corps of Engineers
CEHND	Corps of Engineers, Huntsville Division
CELMS	Corps of Engineers, St. Louis
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERFA	Community Environmental Response Facilitation Act
CFR	Code of Federal Regulations
cfs	Cubic Feet Per Second
COE	Chief of Engineers
COGR	Central Oregon Air to Air Gunnery Range
COMP	Composition
CTG	Cartridge
CSM	Chemical Surety Material
CSM	Command Sergeant Major
CWM	Chemical Warfare Material
CWS	Chemical Warfare Service
DA	Department of the Army

## APPENDIX B

### GLOSSARY AND ACRONYMS (cont'd)

DARCOM	Development and Readiness Command
DEQ	Department of Environmental Quality
DERA	Defense Environmental Restoration Account
DERP	Defense Environmental Restoration Program
DERP-FUDS	Defense Environmental Restoration Program- Formerly Used Defense Sites
DoD	Department of Defense
DOE	Department of Energy
DOI	Department of Interior
EE/CA	Engineering Evaluation/Cost Analysis
EIS	Environmental Impact Statement
EOD	Explosives Ordnance Disposal
EPA	Environmental Protection Agency
ERDA	Environmental Restoration Defense Account
FDE	Findings and Determination of Eligibility
FFMC	Federal Farm Mortgage Corporation
FLCH	Flechette
FS	Feasibility Study
FWS	U. S. Fish and Wildlife Service
FUDS	Formerly Used Defense Sites
GIS	Graphic Information System
GSA	General Services Administration
HE	High Explosive
HEAT	High Explosive Anti-Tank
HEI	High Explosive Incendiary
HEP	Plastic
HE-S	Illuminating
HTRW	Hazardous Toxic and Radioactive Waste
HTW	Hazardous and Toxic Waste
IAS	Initial Assessment Study
INPR	Inventory Project Report
IRP	Installation Restoration Program
MCX	Mandatory Center of Expertise
MG	Machine Gun
MG	Major General
mm	Millimeter
MT	Mechanical Time
MTSQ	Mechanical Time Super Quick
NARA	National Archives and Records Administration
NAS	Naval Air Station
NCDC	National Climatic Data Center
NCP	National Contingency Plan
NFS	National Forest Service
NG	National Guard
NGVD	National Geodetic Vertical Datum

## APPENDIX B

### GLOSSARY AND ACRONYMS (cont'd)

NOAA	National Oceanic and Atmospheric Administration
NOFA	No Further Action
NPRC	National Personnel Records Center
NRC	National Records Center
OEW	Ordnance and Explosive Waste
OSHA	Occupational Safety and Health Act
PA	Preliminary Assessment
PD	Point Detonating
PIBD	Point Initiating, Base Detonating
PL	Public Law
QASAS	Quality Assurance Specialist Ammunition Surveillance
RA	Removal Action
RAC	Risk Assessment Code
RD	Remedial Design
RG	Record Group
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
SARA	Superfund Amendments and Reauthorization Act
SCS	Soil Conservation Service
SLD	St. Louis District, Corps of Engineers
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
SWMU	Solid Waste Management Units
TECOM	Test Evaluation Command
TEU	Technical Escort Unit
TNT	Trinitrotoluene
TP	Target Practice
USA	United States of America
USACE	U.S. Army Corps of Engineers
USADACS	U.S. Army Defense Ammunition Center and School
USAED	U.S. Army Engineer District
USAEDH	U.S. Army Engineer Division, Huntsville, AL
USATHMA	U.S. Army, Corps of Engineers, Toxic and Hazardous Materials Agency
USC	United States Code
USDA	U.S. Department of Army
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UXO	Unexploded Ordnance
WAA	War Assets Administration
WD	War Department
WNRC	Washington National Records Center

**APPENDIX C**  
**TEXT / MANUALS**

**ORDNANCE AND EXPLOSIVE WASTE  
CHEMICAL WARFARE MATERIALS  
ARCHIVES SEARCH REPORT  
FINDINGS  
FOR  
CENTRAL OREGON AIR TO AIR  
GUNNERY RANGE MILITARY RESERVATION  
Lake County, Oregon**

**Project Number F10OR017001**

**APPENDIX C - TEXT/MANUALS**

- C-1 Cartridge, Caliber .50 - TM 9-1901-1, Ammunition for Aircraft Guns, dated December 1957
- C-2 Cartridge, 20 Millimeter - TM 9-1901-1, Ammunition for Aircraft Guns, dated December 1957

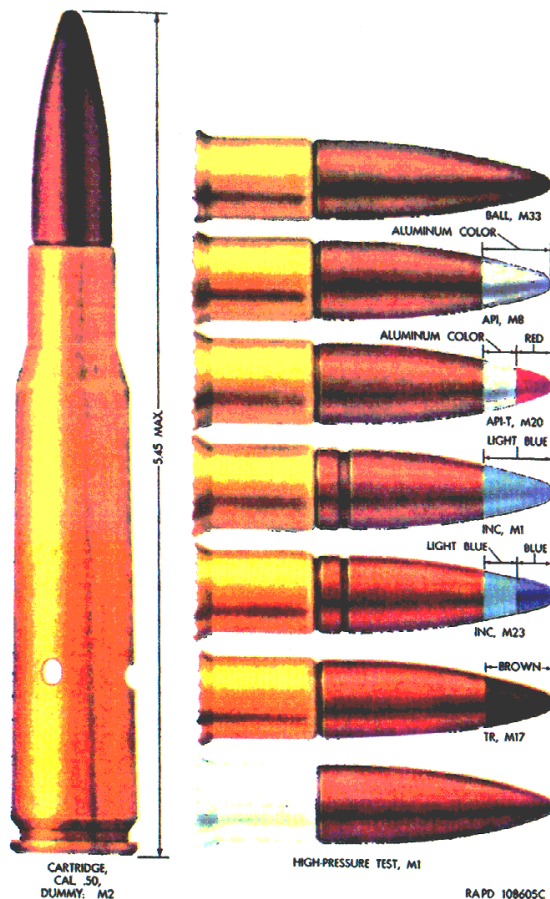


Figure 4. Caliber .50 cartridges.

#### 16. Cartridge, Caliber .50: Armor-Piercing, M2

a. *Cartridge.* This cartridge is designed for use against armored aircraft, armored vehicles, concrete shelters, and similar bullet-resisting targets. The cartridge is 5.45 inches long. It may be identified by the black bullet tip.

b. *Bullet.* The bullet consists of three parts: A gilding-metal jacket, a hardened core of tungsten-chrome or manganese molybdenum steel, and a point filler of an antimony-lead alloy. The overall length of the bullet is 2.31 inches. The base has a 9-degree taper beginning 0.386 inch from the base.

#### 17. Cartridge, Caliber .50: Armor-Piercing-Incendiary, M8

a. *Cartridge.* This cartridge is a round for caliber .50 machine guns. It replaces the incendiary cartridge M1 and armor-piercing cartridge M2 for manufacture and issue. This cartridge is 5.45 inches long. It is identified by the aluminum color bullet tip.

b. *Bullet.* The bullet contains the same core as the armor-piercing bullet, caliber .50, M2, but the point filler is replaced by an incendiary composition and the bullet also contains a lead alloy base filler seal. The length of the bullet is 2.31 inches.

#### 18. Cartridge, Caliber .50: Armor-Piercing-Incendiary, T49

a. *Cartridge.* This cartridge is for use only in caliber .50 aircraft machine guns. It has a higher velocity than the API cartridge, caliber .50, M8 and is intended for use with the incendiary cartridge, caliber .50, M23 (T48), since it has similar exterior ballistics. This cartridge is 5.45 inches in length. It may be identified by the bullet tip, which is painted medium blue with an aluminum color annulus to the rear.

b. *Bullet.* The bullet consists of three parts: A gilding-metal jacket, a hardened manganese-molybdenum steel core, and a point filler of an antimony-lead alloy. The bullet has a square base and is shorter, being 1.935 inches in length, than API bullet, caliber .50, M8.

#### 19. Cartridge, Caliber .50: Armor-Piercing- Incendiary-Tracer, M20

a. *Cartridge.* This cartridge is for caliber .50 machine guns. It is similar to the armor-piercing-incendiary caliber .50, M8 cartridge, with the addition of a tracer element. As this bullet has its own tracer, the use of tracer cartridges for the production of traces is unnecessary in machine gun belts. The cartridge is 5.45 inches long. It is identified by the tip of the bullet, which is painted red with an aluminum annulus to its rear.

b. *Bullet.* The bullet is similar to the armor-piercing-incendiary bullet, caliber .50, M8, but it differs in having a trace. Visible trace begins at approximately 100 yards from muzzle and continues to at least 1,600 yards.



## 20. Cartridge, Caliber .50: Ball, M33

*a. Cartridge.* This cartridge was designed to replace the ball cartridge M2 as an item of issue and to duplicate ballistics of an inert caliber .50 API cartridge M8. It is designed for general use where tracer, incendiary, or armor penetration characteristics are not important considerations. The cartridge is 5.45 inches long and does not have any bullet point identification coloring. As its visual appearance is the same as the ball cartridge M2, this cartridge will be identified by markings on the packing containers. Headstamp markings are a further means of identifying ball M2 and ball M33 cartridges; the last lot of ball cartridges M2 was produced in 1950, whereas the first lot of ball cartridge M33 was manufactured in 1951.

*b. Bullet.* The bullet consists of three parts: A jacket of gilding metal or gilding metal clad steel, a soft steel core, and an inert point filler. The overall length of the bullet is (tapered) 2.31 inches. It has a boat-tailed base.

## 21. Cartridge, Caliber .50: Incendiary, M1

*a. Cartridge.* This cartridge is an item of issue for use in caliber .50 machine guns. The cartridge is 5.45 inches long. It may be identified by the bullet tip, which is painted light blue, and by a second, knurled cannellure rolled into the bullet jacket.

*b. Bullet.* The bullet consists of a gilding-metal jacket, a hollow, cylindrical, steel body, a lead-antimony base slug, and a core and point filler of incendiary composition. The bullet is 2.09 inches long and has a square (cylindrical) base.

## 22. Cartridge, Caliber .50: Incendiary, M23

*a. Cartridge.* This cartridge is an item of issue for use only in caliber .50 aircraft machine guns. It has a higher velocity than the incendiary cartridge M1 and is more effective as an incendiary against aviation kerosene. The cartridge is 5.45 inches long. It may be identified by the bullet tip, which is painted medium blue with a light blue annulus to the rear.

*b. Bullet.* The bullet is similar in external appearance to the incendiary bullet M1. The bullet M23 consists of a gilding-metal jacket, a clad steel container, a lead-antimony base slug, and an incendiary composition. The weight of incendiary composition is greater than that in the incendiary bullet M1. The bullet is 2.290 inches long and has a square (cylindrical) base.

## 23. Cartridge, Caliber .50: Tracer, M1

*a. Cartridge.* This cartridge is an item for observation of fire in caliber .50 machine guns. It is limited to use for training purposes only. It is replaced for combat use by the CARTRIDGE, CALIBER .50: tracer,

M17. Care must be exercised when using this cartridge to prevent it from igniting dry vegetation on the range. This cartridge is 5.45 inches long. It is identified by the tip of the bullet, which is painted red.

*b. Bullet.* The bullet consists of three parts: A gilding-metal or a gilding-metal clad steel jacket, an antimony-lead alloy slug, which fills the forward end of the jacket, and tracer and igniter compositions which fill the balance. Unlike the bullets for armor-piercing and ball cartridges, this bullet is cylindrical to the base which is open to permit the propelling charge to ignite the tracer composition. The overall length of the bullet is 2.40 inches. The trace begins at a distance not greater than 250 feet from the weapon; the range of the trace is about 1,600 to 1,800 yards.

## 24. Cartridge, Caliber .50: Tracer, M10

*a. Cartridge.* This cartridge is for observation of fire in all caliber .50 aircraft machine guns. It serves the same purposes as the tracer cartridge M1. The cartridge is 5.45 inches long. It may be identified by the bullet tip, which is painted orange.

*b. Bullet.* The description and exterior ballistics for the tracer bullet M1 with gilding-metal clad steel jacket are applicable to the tracer bullet M10, except that the M10 has a dim trace for the first 225 yards of flight followed by a bright trace to 1,600 to 1,900 yards.

## 25. Cartridge, Caliber .50: Tracer, M17

*a. Cartridge.* This cartridge can be used as a substitute for the API-T cartridge, caliber .50, M20 except that penetration is not so great. It replaces the tracer cartridge M1 for use in caliber .50 aircraft machine guns. The cartridge is 5.45 inches long. It may be identified by the bullet tip, which is painted brown. The tips of bullets manufactured prior to 1952 were painted maroon.

*b. Bullet.* The description and exterior ballistics for the tracer bullet M1 with gilding-metal clad steel jacket are applicable to the tracer bullet M17, except that the M17 has a bright trace to approximately 2,450 yards of flight. Trace begins at a point not greater than 250 yards from the weapon. Tracer cartridges M17 manufactured since 1950 contain a gilding-metal cup or a vinylite disk, designated as a bullet base closure seal, in the base of the bullet. This seal is intended to prevent chemical action between the bullet tracer composition and the residual moisture in the propellant and, accordingly, to prolong the shelf life of this cartridge.

## 26. Cartridge, Caliber .50: Tracer, Headlight, M21

*a. Cartridge.* This cartridge is for caliber .50 aircraft machine guns for use in combat against other aircraft. When viewed from the front, its trace, due to the use of certain igniter composition instead of tracer composition such as is used in tracer bullet M1, is three times as brilliant as the trace of the tracer bullet M1. The tracer M21 has some incendiary effect at 150 and 350 yards, but is negligible at 600 yards. The cartridge

is 5.45 inches long. It may be identified by the bullet tip, which is painted red.

*b. Bullet.* The description and exterior ballistics of the tracer bullet M1 are applicable to the tracer bullet M21, except that the M21 has a very bright trace to approximately 550 yards.

#### **27. Cartridge, Caliber .50 Blank: M1**

This blank cartridge is for use in aircraft caliber .50 machine guns when these weapons are fitted with blank firing attachments for training operations. The cartridge is 3.910 inches long. It is identified by the absence of the bullet. The cartridge case has a slight annular groove about  $\frac{1}{4}$  inch from the mouth; this serves as the seat for the wad. The wad is a disk punched out of strawboard sheet  $\frac{1}{16}$  inch thick; it is lacquered on both sides before insertion into the mouth of the case. After loading, a heavy coat of vermillion lacquer is applied to the wad and the mouth is crimped.

#### **28. Cartridge, Caliber .50 Dummy: M2**

*a. Cartridge.* This cartridge is for use in all caliber .50 machine guns for training purposes. It may also be used for testing the mechanism of the gun. The cartridge is 5.45 inches long. Some cases of current manufacture may be of steel instead of brass.

*b. Bullet.* The dummy cartridge has a gilding-metal or gilding-metal clad steel jacket. The bullet is 2.40 inches long and has a square (cylindrical) base.

#### **29. Cartridge, Caliber .50: Test, High-Pressure, M1**

*a. Cartridge.* This cartridge is used for proof-firing of caliber .50 machine guns at the place of manufacture or rebuild. The cartridge is loaded with a propellant charge sufficient to develop a breech pressure from 60,000 to 65,000 p.s.i. Due to this excessive pressure and the danger involved in firing, the guns under test are fired from a fixed rest under a hood by means of a mechanical firing device. This cartridge should be fired only by authorized personnel. The cartridge is 5.45 inches long. It is distinguished from other caliber .50 cartridges by the tinned cartridge case.

*b. Bullet.* The bullet consists of a gilding-metal jacket and a core made up of two antimony-lead alloy slugs, a front slug and a rear slug. The length of the bullet is 2.42 inches. The bullet has a square base.

#### **30. Cartridges With Deteriorated Tracer Elements**

Armor-piercing-incendiary-tracer and tracer-types of caliber .50 cartridges with deteriorated tracer elements, as listed in Department of the Army Supply Manual 9-5-1305/United States Air Force Stock List 1300, may be substituted for ball ammunition for training requirements within the continental United States.

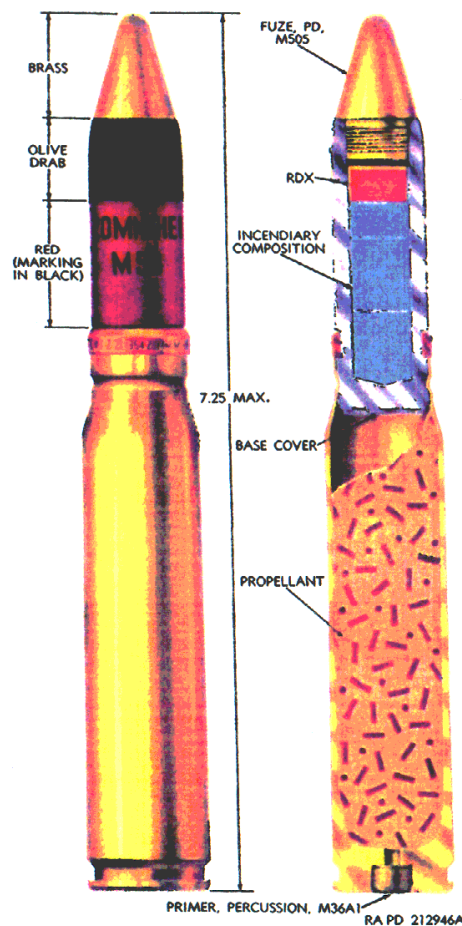


Figure 7. Cartridge, 20 millimeter: HEI, M58 (T241), w/fuze, PD, M505.

### 33. Cartridge, 20 Millimeter: AP-T, M95, Steel Case

This cartridge is the same as the item in paragraph 32, except that the steel cartridge case M21A1B1 is substituted for the M21A1.

### 34. Cartridge, 20 Millimeter: HEI, M58 (T241), W/Fuze, PD, M505

*a. General.* This cartridge (fig. 7), which replaces the M97A1, differs from the M97A1 (par. 36) principally in the interior design and loading of the projectile. It provides an adequate ballistic match with the M97A1. The M58 is an improvement over the M97A1 in blast, fragmentation, and incendiary effect. The weight of the incendiary charge (MOX-2B) is 0.026 pound. The weight of explosive is 0.03 pound, composed of 0.026 pound of MOX-2B and 0.004 pound of RDX. Upon impact, the charge is functioned with a combined detonative and incendiary effect. A base cover is welded to the base of the projectile for additional safety. The PD fuze M505 is an instantaneous percussion fuze of the impact-type. See paragraph 66 for description of this fuze.

#### *b. Data.*

Weight of complete round .....	0.55 lb.
Length of complete round .....	7.25 in. (max.)
Length of fuze projectile .....	3.31 in.
Length of cartridge case .....	4.34 in.
Type of base .....	square

### 35. Cartridge, 20 Millimeter: HEI, M97, W/Fuze, PD, M75

This cartridge, which is replaced by the M97A1, differs from the M97A1 (par. 36) principally in the fuze. The fuze M75, which is described in paragraph 65, has no interrupter or other special devices for boresafety. In this respect, it differs from the fuze M505.

### 36. Cartridge, 20 Millimeter: HEI, M97A1, W/Fuze, PD, M505

*a. General.* This cartridge is for use against aircraft and light materiel targets, functioning with both explosive and incendiary effect. The high-explosive is tetryl and is located in the nose portion of the projectile, while the incendiary mixture is located in the base. The combined weight of the high-explosive-incendiary filler is 0.017 pound composed of 0.005 pound of incendiary mixture and 0.012 pound of tetryl. Upon impact, its filler is detonated, the shell shattered, and the incendiary composition ignited. Its fuze is an instantaneous percussion fuze of the impact-type. The thickness of the base is approximately 0.2 inch, and a base cover is welded thereon for additional protection.

**APPENDIX D**  
**REPORTS / STUDIES**

**ORDNANCE AND EXPLOSIVE WASTE  
CHEMICAL WARFARE MATERIALS  
ARCHIVES SEARCH REPORT  
FINDINGS  
FOR  
CENTRAL OREGON AIR TO AIR  
GUNNERY RANGE MILITARY RESERVATION  
Lake County, Oregon**

**Project Number F10OR017001**

**APPENDIX D -- REPORTS/STUDIES**

- D-1 Inventory Project Report and Findings and Determinations for Central Oregon Air-to-Air Gunnery Range, Portland District Corps of Engineers, 1993.

SITE SURVEY SUMMARY SHEET  
FOR  
DERP-FUDS SITE NO. F10OR017000  
CENTRAL OREGON AIR TO AIR GUNNERY RANGE MILITARY RESERVATION  
27 MAY 93

SITE NAME: Central Oregon Air to Air Gunnery Range Military Reservation

LOCATION: Lake County, Oregon, approximately 35 miles north of the City of Lakeview, Oregon.

SITE HISTORY: In April 1942, 737,000 acres was acquired by the Army by use permit from the Department of the Interior and lease action was begun to acquire 60,395.65 acres from private parties, the state of Oregon, and Lake County, for use as an air to air gunnery range. Of the leased land, 2,338.83 acres leases were never negotiated, therefore, the total land acquired was 795,056.77 acres. The only known improvements constructed on this site, were the two earthen berms adjacent to Alkali Lake and the line of wooden target frames (assumed) on the northern berm. These target frames are nearly rotted away, leaving only the bases. In June 1947 the Army declared the property as surplus and the use permit was terminated. In 1948 the acquired leases and the pending lease action were terminated.

SITE VISIT: On 27 May 1993, Jerry Gardenhire and John Todd, CENPP-PE-DC, visited the site with Mr. Dan Stewardson of the Department of the Interior, Bureau of Land Management (BLM), Lakeview District Office. Prior to the site visit, Mr. Stewardson, Jane Simpson of the Lake County Sheriff's Office and Don Cates, Lake County Emergency Services Director, were interviewed over the telephone.

CATEGORY OF HAZARD: OEW.

PROJECT DESCRIPTION: There is one potential project at the site.

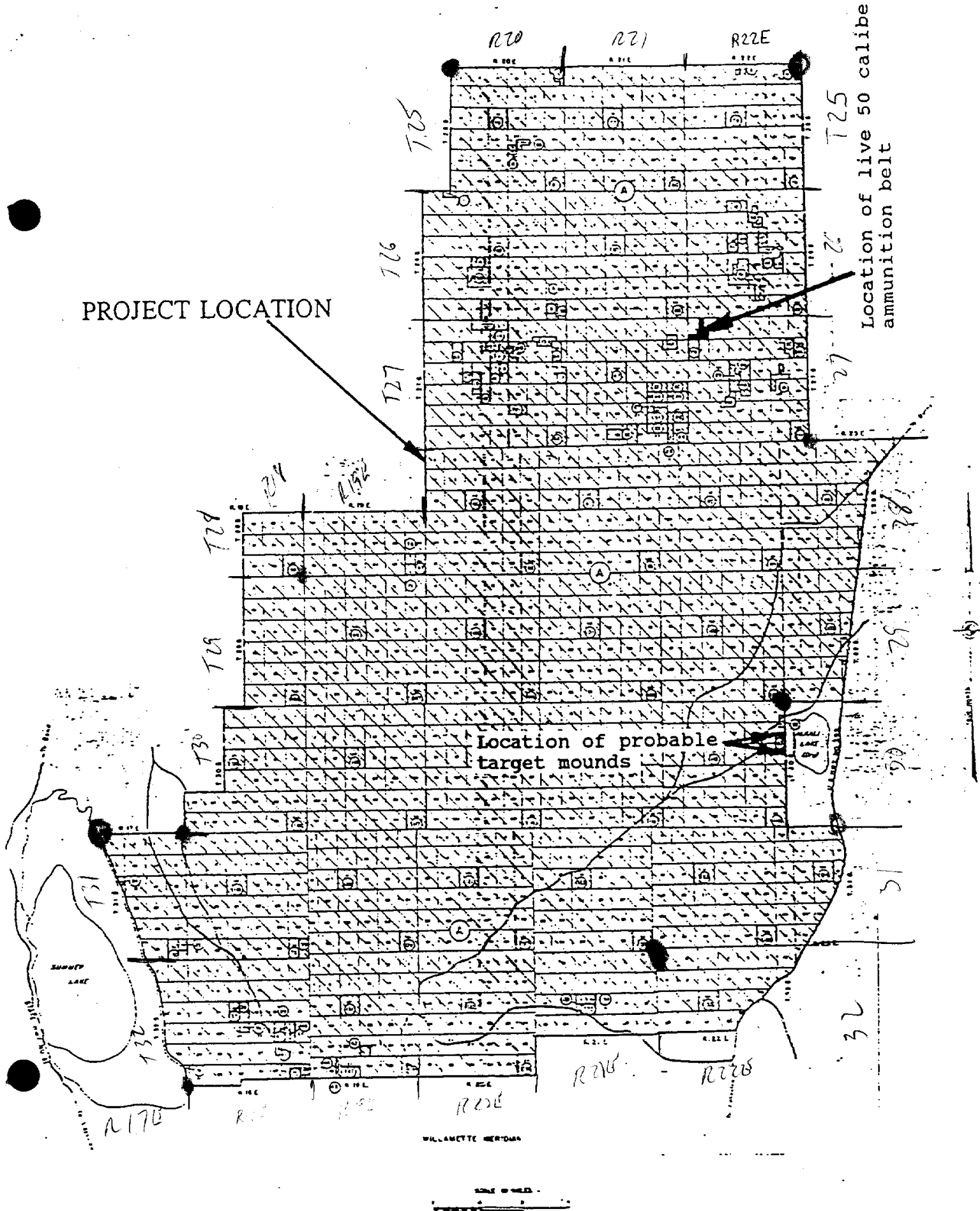
a. OEW. The site is a former aerial gunnery range. Hazardous waste may be present at the site.

PA POC: Michael Gross, CENPP-PE-DC, (503) 326-6489.





PROJECT LOCATION



Central Oregon Air to Air  
Gunnery Range  
F10OR017000





DEFENSE ENVIRONMENTAL RESTORATION PROGRAM  
FORMERLY USED DEFENSE SITES  
FINDINGS AND DETERMINATION OF ELIGIBILITY

CENTRAL OREGON AIR TO AIR GUNNERY RANGE MILITARY RESERVATION

SITE NUMBER F10OR017000

FINDINGS OF FACT

1. The War Department acquired 737,000.00 acres of public domain and initiated the acquisition of 60,395.60 acres of lease lands for which 2,338.83 acres were never negotiated for the Central Oregon Air to Air Gunnery Range. The Department of the Interior issued a Use Permit dated April 20, 1942 for the public domain lands. The lease information was incomplete. However, the leases were acquired between 1942 and 1943. The total area acquired is 795,056.77 acres.


2. The records are incomplete as to whether any improvements were constructed at the site. The site was determined to be under DOD control during the period of DOD jurisdiction and use.

3. The War Department declared the site excess to their needs on June 13, 1947. The 58,056.77 acres of acquired leases and 2,338.83 acres of pending leases were cancelled on January 1, 1948. The Corps of Engineers relinquished the use permit to the Department of the Interior by letter dated November 24, 1947. The total area excessed that are being considered in this report is 795,056.77 acres.

DETERMINATION

Based on the foregoing Findings of Fact, the site has been determined to be formerly used by the Department of Defense. It is therefore eligible for the Defense Environmental Restoration Program - Formerly Used Defense Sites established under 10 U.S.C. 2701, et seq.

1 Oct 93  
Date

  
ERNEST J. HARRELL  
Major General, USA  
Commanding

PROJECT SUMMARY SHEET  
FOR  
DERP-FUDS OEW PROJECT F10OR017001  
CENTRAL OREGÓN AIR TO AIR GUNNERY RANGE MILITARY RESERVATION  
SITE NO. F10OR017000  
27 MAY 93

PROJECT DESCRIPTION: This is a former Army aerial gunnery range. The entire range was hilly, semi-arid grazing land which was essentially unchanged after DOD use. The only known improvements constructed on this site, were two earthen berms adjacent to Alkali Lake and the line of wooden target frames (assumed) on the northern berm. These target frames are nearly rotted away, leaving only the bases. The town of Paisley, Oregon is approximately 45 miles south of the southern boundary of the gunnery range and approximately 63 miles south of the Alkali Lake berms. The range is bounded by US Highway 395 on the east, State Highway 31 on the south and west and a Lake County road on the north. Records indicate that the property was inspected and cleared of any ordnance prior to the termination of the leases and use permit. A belt of live 50 caliber ammunition was found in the northern part of the range in 1990. Expended 20 mm and 50 caliber rounds were found adjacent to the two berms during the site inspection. Though the RAC score is a 5, presence of the expended rounds, the berms, the wooden frame remains, and the discovery of live ammunition in the past, indicates the possibility of finding further OEW contamination. Therefore, further investigation of the entire range area is recommended.

PROJECT ELIGIBILITY: Records indicate that the area was used by the Army for aerial gunnery practice.

POLICY CONSIDERATIONS: There is no policy applicable to this project.

PROPOSED ACTIVITIES: The INPR should be referred to HND for a determination of further action.

RAC: Attached. The RAC score is II-E, 5.

POC: Michael Gross, CENPP-PE-DC, (503) 326-6489.

# RISK ASSESSMENT PROCEDURES FOR ORDNANCE AND EXPLOSIVE WASTE (OEW) SITES

Site Name Central Ore. Aerial Gunnery Range  
 Site Location Lake County, Oregon  
 DERP Project # F10OR017001  
 Date Completed May 27, 1993

Rater's Name Jerry R. Gardenhire  
 Phone Number (503) 326-6488  
 Organization CENPP-PE-DC  
 RAC IL-E RAC-5-4

*Corrected 8/10/14/93*

## OEW RISK ASSESSMENT:

This risk assessment procedure was developed in accordance with MIL-STD 882B and AR 385-10. The RAC score will be used by CEHND to prioritize the remedial action at this site. The OEW risk assessment should be based upon best available information resulting from records searches, reports of Explosive Ordnance Disposal (EOD) detachment actions, and field observations, interviews, and measurements. This information is used to assess the risk involved based upon the potential OEW hazards identified at the site. The risk assessment is composed of two factors, hazard severity and hazard probability. Personnel involved in visits to potential OEW sites should view the CEHND videotape entitled "A Life Threatening Encounter: OEW."

Part I. Hazard Severity. Hazard severity categories are defined to provide a qualitative measure of the worst credible mishap resulting from personnel exposure to various types and quantities of unexploded ordnance items.

### TYPE OF ORDNANCE (Circle all values that apply)

A. Conventional Ordnance and Ammunition	VALUE
Medium/Large Caliber (20 mm and larger)	10
Bombs, Explosive	10
Grenades, Hand and Rifle, Explosive	10
Landmines, Explosive	10
Rockets, Guided Missiles, Explosive	10
Detonators, Blasting Caps, Fuzes, Boosters, Burstern	6
Bombs, Practice (w/spotting charges)	6
Grenades, Practice (w/spotting charges)	4
Landmines, Practice (w/spotting charges)	4
Small Arms (.22 cal - .50 cal)	1
Conventional Ordnance and Ammunition (Select the largest single value)	<u>10</u>

What evidence do you have regarding conventional OEW? Site inspection uncovered bullets and shells of 50 caliber and 20mm or 30mm bullets, plus verbal accounts of finding scattered bullets, shells, and a belt of live 50 caliber bullets.

B. Pyrotechnics (For munitions not described above.)

VALUE

Munitions (Container) Containing  
White Phosphorus or other  
Pyrophoric Material (i.e.,  
Spontaneously Flammable)

10

Munition Containing A Flame  
or Incendiary Material (i.e.,  
Napalm, Triethylaluminum Metal  
Incendiaries)

6

Flares, Signals, Simulators

4

Pyrotechnics Value (Select the largest single value)

0

What evidence do you have regarding pyrotechnics? No evidence of pyrotechnics OEW has been found in 50+ years of activity in the area.

C. Bulk High Explosives (Bulk explosives not an integral part of conventional ordnance; uncontainerized.)

VALUE

Primary or Initiating Explosives  
(Lead Styphnate, Lead Azide,  
Nitroglycerine, Mercury Azide,  
Mercury Fulminate, Tetracene, etc.)

10

Demolition Charges

10

Secondary Explosives  
(PETN, Compositions A, B, C,  
Tetryl, TNT, RDX, HMX, HBX,  
Black Powder, etc.)

8

Military Dynamite

6

Less Sensitive Explosives  
(Ammonium Nitrate, Explosive D, etc.)

3

High Explosives (Select largest single value)

0

What evidence do you have regarding bulk explosives? No evidence of explosives OEW has been found in 50+ years of activity in the area.

D. Bulk Propellants (Not an integral part of rockets, guided missiles, or other conventional ordnance; uncontainerized)

VALUE

Solid or Liquid Propellants

6

Propellants

0

What evidence do you have regarding bulk propellants? No evidence of propellant OEW has been found in 50+ years of activity in the area.

E. Radiological/Chemical Agents/Weapons

VALUE

Toxic Chemical Agents  
(Choking, Nerve, Blood, Blister)

25

War Gas Identification Sets

20

Radiological

15

Riot Control and Miscellaneous  
(Vomiting, Tear, incendiary and smoke)

5

Radiological/Chemical Agent/Weapons (Select the largest single value)

0

What evidence do you have regarding chemical/radiological OEW? No evidence of chemical/radiological OEW has been found in 50+ years of activity in the area.

Total Hazard Severity Value

10

(Sum of Largest Values for A through E—Maximum of 61).

Apply this value to Table 1 to determine Hazard Severity Category.

TABLE 1

HAZARD SEVERITY

Description	Category	Value
CATASTROPHIC	I	$\geq 21$
CRITICAL	II	$\geq 10 < 21$
MARGINAL	III	$\geq 5 < 10$
NEGLIGIBLE	IV	$\geq 1 < 5$
**NONE		0

\*Apply Hazard Severity to Table 3.

\*\*If Hazard Severity Value is 0, you do not need to complete Part II. Proceed to Part III and use a RAC Score of 5 to determine your appropriate action.

Part II. Hazard Probability. The probability that a hazard has been or will be created due to the presence and other rated factors of unexploded ordnance or explosive materials on a formerly used DOD site.

AREA, EXTENT, ACCESSIBILITY OF OEW HAZARD  
(Circle all values that apply)

A. Locations of OEW Hazards

	VALUE
On the surface	5
Within Tanks, Pipes, Vessels or Other confined Locations.	4
Inside walls, ceilings, or other parts of Buildings or Structures.	3
Subsurface	2
Location (Select the single largest value)	<u>5</u>

What evidence do you have regarding location of OEW? Discovery of spent 20 or 30mm bullets and 50 caliber brass and bullets, plus verbal account of finding a belt of live 50 caliber rounds.

B. Distance to nearest inhabited locations or structures likely to be at risk from OEW hazard (roads, parks, playgrounds, and buildings).

	Value
Less than 1250 feet	5
1250 feet to 0.5 mile	4
0.5 mile to 1.0 mile	3
1.0 mile to 2.0 miles	2
Over 2.0 miles	1
Distance (Select the single largest value)	<u>1</u>

What are the nearest inhabited structures? State of Oregon Highway Department Maintenance Station on the east side of Alkali Lake and a private store/residence are closest to probable target area west of Alkali Lake. Live 50 caliber rounds in a belt are probably not within 2 miles of any inhabited structures.

C. Numbers and types of Buildings within a 2 mile radius measured from the OEW hazard area, not the installation boundary.

	Value
26 and over	5
16 to 25	4
11 to 15	3
6 to 10	2
1 to 5	1
0	0

Number of Buildings (Select the single largest value) 0

Narrative All buildings seen during the site inspection are located outside the 2 mile radius.

D. Types of Buildings (within a 2 mile radius)

	Value
Educational, Child Care, Residential, Hospitals, Hotels, Commercial, Shopping Centers, etc.	5
Industrial Warehouse, etc.	4
Agricultural, Forestry, etc.	3
Detention, Correctional	2
No Buildings	0

Types of Buildings (Select the largest single value) 0

Describe types of buildings in the area. There are no buildings in the 2 mile radius.



E. Accessibility to site refers to access by humans to ordnance and explosive wastes. Use the following guidance:

BARRIER	VALUE
No barrier or security system	5
Barrier is incomplete (e.g., in disrepair or does not completely surround the site). Barrier is intended to deny egress from the site, as for a barbed wire fence for grazing.	4
A barrier, (any kind of fence in good repair) but no separate means to control entry. Barrier is intended to deny access to the site.	3
Security guard, but no barrier	2
Isolated site	1
A 24-hour surveillance system (e.g., television monitoring or surveillance by guards or facility personnel) which continuously monitors and controls entry onto the facility; or An artificial or natural barrier (e.g., a fence combined with a cliff), which completely surrounds the facility; and a means to control entry, at all times, through the gates or other entrances to the facility (e.g., an attendant, television monitors, locked entrances, or controlled roadway access to the facility).	0
Accessibility (Select the single largest value)	5

Describe the site accessibility. The area is approximately 800,000 acres in an unpopulated part of Oregon. The land generally has no permanent residents, only hunters and the occasional BLM person or crew, and has virtually no roads or other access routes.

F. Site Dynamics - This deals with site conditions that are subject to change in the future, but may be stable at the present. Examples would be excessive soil erosion by beaches or streams, increasing land development that could reduce distances from the site to inhabited areas or otherwise increase accessibility.

	VALUE
Expected	5
None Anticipated	0
Site Dynamics (Select the single largest value)	0

Describe the site dynamics. Site dynamics are not expected to change due to the area's location and current use.

Total Hazard Probability Value  
 (Sum of Largest Values for A through F—Maximum of 30)  
 Apply this value to Hazard Probability Table 2 to determine  
 Hazard Probability Level.

8F ~~2~~ 11

TABLE 2

HAZARD PROBABILITY

Description	Level	Value
FREQUENT	A	$\geq 27$
PROBABLE	B	$\geq 21 < 27$
OCCASIONAL	C	$\geq 15 < 21$
REMOTE	(D) 8F	$\geq 8 < 15$
IMPROBABLE	E	$\leq 8$

\*Apply Hazard Probability to Table 3.

Part III. Risk Assessment. The risk assessment value for this site is determined using the following Table 3. Enter with the results of the hazard probability and hazard severity values.

TABLE 3

Probability Level		FREQUENT A	PROBABLE B	OCCASIONAL C	REMOTE D	IMPROBABLE E
Severity Category:						
CATASTROPHIC	I	1	1	2	3	4
CRITICAL	II	1	2	3	4	5
MARGINAL	III	2	3	4	4	5
NEGLIGIBLE	IV	3	4	4	5	5

RISK ASSESSMENT CODE (RAC)

RAC 1 Imminent Hazard - Expedite INPR - Immediately call CEHND-ED-SY—commercial 205-955-4968 or DSN 645-4968.

RAC 2 High priority on completion of INPR - Recommend further action by CEHND.

RAC 3 Complete INPR - Recommend further action by CEHND.

RAC 4 Complete INPR - Recommend further action by CEHND.

RAC 5 Recommend no further action. Submit NOFA and RAC to CEHND.

=====  
Part IV. Narrative. Summarize the documented evidence that supports this risk assessment. If no documented evidence was available, explain all the assumptions you made.

Based on our telephone interviews with the Lake County Sheriff's Office and the Lake County Emergency Services Director, there have been no reports of OEW found in the area. Based on our preliminary site inspection and a telephone interview with the BLM Hazardous Materials Specialist, only scattered, spent rounds and brass and 1 belt of live 50 caliber rounds have been found in the area. Though the RAC score for this site is a 5, further study is recommended.

Should be RAC 4. JF.

## CONTACT LISTING

### 1. Lake County, Oregon

#### a. County Emergency Services

- (1) Contact Name: Don Cates (Director)
- (2) Address: County Courthouse, 513 Center Street, Lakeview, Oregon 97630
- (3) Telephone Number: (503) 947-6012
- (4) Interview Information: Don Cates hasn't heard of any OEW being found in the area, or that the area was used as a gunnery range.

#### b. County Sheriff's Office

- (1) Contact Name: Jane Simpson (job title unknown)
- (2) Address: 513 Center Street, Lakeview, Oregon 97630
- (3) Telephone Number: (503) 947-6027
- (4) Interview Information: Jane hadn't heard of any reports of ordnance found in the area. She suggested that I speak to the County Emergency Services Director.

### 2. U.S. Government (BLM, Lakeview District Office)

#### a. Contact Name: Mr. Dan Stewardson

#### b. Address: P.O. Box 151; Lakeview, Oregon 97603

#### c. Telephone Number: (503) 947-2177

d. Interview Information: Mr. Stewardson, initially, said that he has been there for 12 years and he's found 1 belt of live 50 caliber rounds in the north end of the area in that time. He hadn't heard of anyone finding any other unexploded OEW, just scattered bullets and/or brass. Prior to our site inspection he talked to some other staff members and found out that two mounds of dirt were thought to have been built by the Army for targets. These two sites are immediately west of Alkali Lake. He took us to the mounds, where we found spent bullets (20 or 30mm and 50 caliber) and several shell casings, as well as a line of wooden boxes, which appear to have been the bases for target frames. The target frames were found on top of the northern mound, where most of the spent rounds were found (on the west side of the mound). Both mounds are located north of the chemical waste disposal site southwest of Alkali Lake. The northern site is in the east 1/2 of Section 12, T.30S., R22E. and the southern site is in the east 1/2 of Section 13, T.30S., R22E.

## **APPENDIX E**

### **LETTERS / MEMORANDA / MISCELLANEOUS ITEMS**

**ORDNANCE AND EXPLOSIVE WASTE  
CHEMICAL WARFARE MATERIALS  
ARCHIVES SEARCH REPORT  
FINDINGS  
FOR  
CENTRAL OREGON AIR TO AIR  
GUNNERY RANGE MILITARY RESERVATION  
Lake County, Oregon**

**Project Number F10OR017001**

**APPENDIX E**

**LETTERS/MEMORANDA/MISCELLANEOUS ITEMS**

- E-1 Letter from Corps of Engineers Department of Interior, dated November 24, 1947.  
Real Estate Division, U.S. Army Corps of Engineers, Seattle District.

602 Central Oregon  
Gunnery Range, Oregon. ENCLT

EG/lj

HOIN

~~24 November 1947~~

LBK

GFM

Director,  
Department of Interior,  
Bureau of Land Management,  
Washington, D.C.

Dear Sir:

Reference is made to letter from your Department dated 20 April 1942, authorizing the Department of the Army to use 737,000 acres of public land located 35 miles north of Lakeview in Lake County, Oregon, in connection with the Central Oregon Gunnery Range.

The aforementioned lands are no longer required by this Department and permission to use the lands is hereby relinquished.

The lands have been examined and have been cleared of all explosives or explosive objects reasonably possible to detect by visual inspection. Restoration of the lands is not deemed necessary. By letter dated 31 October 1947, Mr. Maurice W. March, Acting Regional Grazier, Swan Island Station, Oregon, advised the Division Engineer at Portland, Oregon, that the lands were in satisfactory condition.

Your cooperation in making these lands available to this Department is appreciated.

FOR THE CHIEF OF ENGINEERS:

Sincerely yours,

PETER P. GOESZ,  
Colonel, Corps of Engineers,  
Assistant Chief of Engineers for Real Estate

*Realty*

**APPENDIX F**  
**REAL ESTATE DOCUMENTS**



**ORDNANCE AND EXPLOSIVE WASTE  
CHEMICAL WARFARE MATERIALS  
ARCHIVES SEARCH REPORT  
FINDINGS  
FOR  
CENTRAL OREGON AIR TO AIR  
GUNNERY RANGE MILITARY RESERVATION  
Lake County, Oregon**

**Project Number F10OR017001**

**APPENDIX F -- REAL ESTATE DOCUMENTS**

- F-1 Declaration of Excess of Leased Property, dated December 16, 1946. Real Estate Division, U.S. Army Corps of Engineers, Portland District.

HEADQUARTERS  
WALLA WALLA ARMY AIR FIELD  
WASHINGTON

DEC 16, 1946

54A10 602

SUBJECT: Declaration of Excess of Leased Property.

THRU: Commanding Officer  
200th AAF Base Unit (Special)  
Colorado Springs, Colorado

TO: Commanding General  
~~Walla Walla Army Air Field~~  
Colorado Springs, Colorado.

1. In compliance with AAF Reg. 85-3 of 12 May 1945 as amended by AAF Reg. 85-3A of 23 July 1946 and AAF Reg. 85-3B of 30 October 1946, declaration of excess covering the property known as the Central Oregon Aerial Gunnery Range is hereby submitted:

a. Property is known as Central Oregon Aerial Gunnery Range.

b. Subject range is located in Lake County in the State of Oregon, 48 miles southwest of Burns, Oregon, and 35 miles north of Lakeview, Oregon.

c. This range consists of ~~297,422.43 acres, of which 297,000 acres are on use permit from the Department of Interior of the War Department, and 422.43 acres privately owned.~~ Owners and lease numbers submitted as follows:

Tract No.	Acres Leased	Unnegotiated Acres	Annual Rental	Lease Number	Lessor
1	147.46		1.00	W-698-eng-2804	J. L. Linebaugh
2	160.00		1.00	W-698-eng-2807	Sarah J. Cooper
3,7,17,30,45	1600.00		1.00	W-698-eng-2818	Chewacan Land & Cattle Co
4		160.39	3.20*	Unnegotiated	Tom L. Cowen
5		80.43	1.60*	Unnegotiated	C. H. Barns, et al
6	320.00		1.00	W-698-eng-2805	John S. Bollock
8		40.00	1.00*	Unnegotiated	John Driman
9	200.00		4.00	W-04-193-eng-5314	Edna L. Cooper
10		320.00	6.40*	Unnegotiated	Esther D. Newton
11	480.00		1.00	W-698-eng-2813	E. Carlon & Co.
12		320.00	20.00*	Unnegotiated	A.A. Warner
13	320.00		1.00	W-698-eng-2808	Flora E. Hanson, Exec.
14	320.00		10.00	W-04-193-eng-5621	Vernon H. Cheldelin
15	320.00		6.40	W-04-193-eng-5312	Sophie K. Kyle et vir
16		320.00	6.40*	Unnegotiated	W. B. Freeman
18	320.00		6.40	W-04-193-eng-5310	Erich T. Richter et ux
19	320.00		6.40	W-04-193-eng-5309	Agnes Carlson Pierson
20	320.00		6.40	W-04-193-eng-5354	Joe E. Ringrose et ux
21	320.00		6.40	W-04-193-eng-5355	T. J. Otis, Est.
22	320.00		6.40	W-04-193-eng-5356	J.W. Hornbuckle
23		160.00	3.20	Unnegotiated	B.S. Durkee
24	320.00		30.00	W-04-193-eng-3684	J.W. Sutherland et al
25	320.00		15.00	W-04-193-eng-5353	W. R. Williams
26		320.00	6.40*	W-04-193-eng-5251	Herbert Sherrill
27	220.00		4.40	W-04-193-eng-5350	Mildren C. O'Kief
28	325.18		40.00	W-04-193-eng-5349	David Pearlman
29		160.00	30.00	Unnegotiated	Benton S. Durkee
31	320.00		8.40	W-04-193-eng-5348	L. Lockwood

BASIC: S4A10 602 Hq, WVAALd, 16 Dec 46, subj: Declaration of Excess of Leased Property.

2		80.00	1.60*	Unnegotiated	H.C. Beckwith
3	320.00		6.40	W-04-193-eng-5346	American Soda Products Co
4		128.40	3.00*	Unnegotiated	Albert Newell
5	160.00		3.20	W-04-193-eng-5344	Marie K. Uncapher
6		150.11	3.00*	Unnegotiated	F.H. McCulloch
37		320.00	6.40*	"	Alice C. Woodward
38		320.00	6.40*	"	Joe C. McKissick
39	160.00		3.20	W-04-193-eng-5341	Alida DeVaul
40	480.00		9.60	W-04-193-eng-5340	Adelbert DeVaul
41 & 42	359.26		125.00	W-04-193-eng-3686	C. E. Campbell et ux
43		110.00	2.00*	Unnegotiated	Aloy Evinger
44		50.00	1.00*	Unnegotiated	Burnice Amos Pope
	737,000.00		Free	Use Permit	Dept. Interior
	37,542.60		750.00	W-698-eng-2814	State of Oregon
	11,388.58		10.00	W-698-eng-2781	Lake County
	<u>794,383.08</u>	<u>3,039.33</u>	<u>1,163.20</u>	TOTALS	(* Estimated)

d. Property is ~~mostly~~, ~~semi-arid~~ grazing land without buildings or structures.

e. The present condition of the property is virtually the same as when taken over by the War Department. ~~However, some unexploded bombs may exist on the range. No knowledge is available as to whether any dedudding has been done on this property.~~

f. Available records at this station indicate that Central Oregon Aerial Gunnery Range was used largely for ~~air to air training purposes. However, it is possible that it may have been used to some extent for air to ground bombing operations.~~

g. The installation above referred to will no longer be required after 16 December 1946.

h. There are no auxiliary facilities to be disposed of at this range.

i. There are no contractual commitments affecting disposition of subject range.

j. There are no statements currently being rendered or existing obligations to the Army, Navy or other Federal Agency.

k. It is recommended that properties referred to above be returned to the original owners as they are no longer required by the Army Air Forces for the purpose for which they were originally procured.

2 Incls

2 Maps - Gen. Ore. Gun. Rge.

KARL W. CRISS

Major, Air Corps

Administrative Officer

S4 602

1st Ind.

26 DEC 1946

HEADQUARTERS 200th AAF BASE UNIT (Special), Colo Springs, Colo,  
TO: Commanding General, Fifteenth Air Force, Colorado Springs, Colorado.

2 Incls

n/c

ENGU 684

2d Ind.

17 JAN 1947

17

HEADQUARTERS FIFTEENTH AIR FORCE, Colorado Springs, Colorado.

TO: Commanding General, Strategic Air Command, Andrews Field, Washington 20, D. C.

1. Pursuant to instructions given in Section IV of AAF Regulation 85-3, 12 May 1945 and AAF Regulation 85-3A, 23 July 1946, the Central Oregon Aerial Gunnery Range, is declared excess to the needs of this command effective immediately.

2. Pertinent data for the above installation, as required by cited regulations, is given in basic letter.

FOR THE COMMANDING GENERAL:

DALE O. REYNOLDS

CGO USA

**APPENDIX G**  
**NEWSPAPERS / JOURNALS**  
**NOT USED**

**APPENDIX H**  
**INTERVIEWS**

ORDNANCE AND EXPLOSIVE WASTE  
CHEMICAL WARFARE MATERIALS  
ARCHIVES SEARCH REPORT  
FINDINGS  
FOR  
CENTRAL OREGON AIR TO AIR  
GUNNERY RANGE MILITARY RESERVATION  
Lake County, Oregon

Project Number F10OR017001

APPENDIX H -- INTERVIEWS

<u>Person Contacted</u>	<u>Position/Organization</u>
Jane Cupernall	Tele# (503)573-2636 Burns Chamber of Commerce 18 West D Street Burns, OR 97720
Karen Devaurs	Tele# (503)947-3378 <i>Lake County Examiner</i> 305 No. F Lakeview, OR 97630
Gene DuPue	Tele# (503)573-6738 Harney County Assessor 450 N. Buena Vista Burns, OR 97720
Katheren Ferl	Tele# (503)947-2220 Schmick Museum & Lake County Museum 128 South East St Lakeview, OR 97630
David Glerup	Tele# (503)573-6156 Burns (Harney Co.) Sheriff 485 N. Court Burns, OR 97720
Jeff Ingalls	Tele# (503) 388-6146 Hazardous Waste Specialist Oregon Department of Environmental Quality (DEQ) 811 S.W. 6th Avenue Portland, OR 97204

Walt Leehman Jr.

Tele# (503)947-3502  
Native of Alkali Lake area

Eugene Luckey

Tele# (503)573-7639  
Burns Historical Society  
144 East E Street  
Burns, OR 97720

Brian McClure

Tele# (503)229-6568  
Hazardous Waste Specialist  
Oregon Department of Environmental  
Quality (DEQ)  
811 S.W. 6th Avenue  
Portland, OR 97204

Bill Murphy

Tele# (503)280-7064  
Bureau of Land Management  
1300 Northeast 44th Ave  
Portland, OR

Jim Ogel

Tele# (503)947-2220  
Lakeview Historical Society  
P.O. Box 48  
Lakeview, OR 97630

Corky Palmer

Tele# (503)573-6451  
Private Engineering Firm  
254 N. Alder  
Burns, OR 97720

Ray Simms

Tele# (503) 947-6003  
Planning Director  
Lake County  
513 Center Street  
Lakeview, OR 97630

Dan Stewardson  
Doug Troutman

Tele# (503)947-6113  
Bureau of Land Management  
P.O. Box 151  
Lakeview, OR 97630

### Interview Summaries

Walt Leehman Jr.  
(503)947-3502

Mr. Leehman has lived in the Alkali Lake area all of his life. He remembers finding .50 caliber shells in the lake. Alkali Lake was used for the Central Oregon Air-to-Air Gunnery Range and for the Northwest Maneuver's of 1944. He also recalls seeing the wooden structures that were probably being used for targets.

Doug Troutman  
Bureau of Land Management  
P.O. Box 151  
Lakeview, OR 97630  
(503)947-6113

The Lakeview BLM District provided the St. Louis Corps District with information regarding the HTW area that is maintained inside the Alkali Lake area. Mr. Troutman also explained that the project site is mainly public land, but with some state and private holdings.

Brian McClure  
Tele# (503)229-6568  
Hazardous Waste Specialist  
Oregon Department of Environmental Quality (DEQ)  
811 S.W. 6th Avenue  
Portland, OR 97204

The State of Oregon is responsible for the restricted area near Alkali Lake. It is marked with warning signs and is the result of private disposal. Mr. McClure is the point of contact in the Department of Environmental Quality for this site. They are currently assessing the area and monitoring for ground water, etc. He verified that it was a private company that disposed of approximately 80,000 drums in this landfill, and the State has assumed responsibility since the middle 1970's. Another contact at DEQ is Jeff Ingalls (503) 388-6146.



**APPENDIX I**  
**PRESENT SITE PHOTOGRAPHS**

**ORDNANCE AND EXPLOSIVE WASTE  
CHEMICAL WARFARE MATERIALS  
ARCHIVES SEARCH REPORT  
FINDINGS  
FOR  
CENTRAL OREGON AIR TO AIR  
GUNNERY RANGE MILITARY RESERVATION  
Lake County, Oregon**

**Project Number F10OR017001**

**APPENDIX I - PRESENT SITE PHOTOGRAPHS**

<b>PAGE</b>	<b>DESCRIPTION</b>
<b><u>Page I-1</u></b>	
<b>Photo #1</b>	Looking east across top of southern berm. Note target debris.
<b>Photo #2</b>	Target remnant with pieces of oxidized copper jackets.
<b><u>Page I-2</u></b>	
<b>Photo #3</b>	.50 caliber round.
<b>Photo #4</b>	Another .50 cal round, typical of those found in area.
<b><u>Page I-3</u></b>	
<b>Photo #5</b>	HTW site.



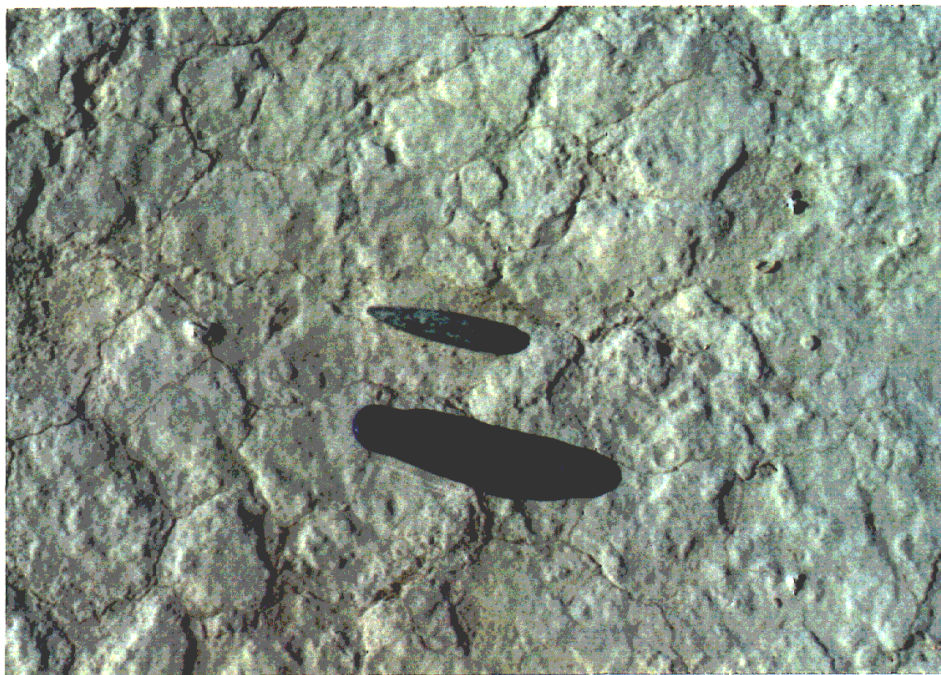
**#1 Looking east across top of southern berm. Note target debris.**



**#2 Target remnant with pieces of oxidized copper jackets.**



**#3 .50 caliber round.**



**#4 Another .50 cal round, typical of those found in area.**





**#5 HTW site.**

**APPENDIX J**  
**HISTORICAL PHOTOGRAPHS**  
**NOT USED**

**APPENDIX K**  
**HISTORICAL MAPS / DRAWINGS**  
**NOT USED**

## **APPENDIX L**

### **SITE SAFETY AND HEALTH PLAN / SITE INSPECTION REPORT**



**ORDNANCE AND EXPLOSIVE WASTE  
CHEMICAL WARFARE MATERIALS  
ARCHIVES SEARCH REPORT  
FINDINGS  
FOR  
CENTRAL OREGON AIR TO AIR  
GUNNERY RANGE MILITARY RESERVATION  
Lake County, Oregon**

**Project Number F10OR017001**

**APPENDIX L**

**SITE SAFETY AND HEALTH PLAN/SITE INSPECTION REPORT**

Site Safety and Health Plan for Central Oregon Air to Air Gunnery Range

The Site Inspection Report is located in Section 6.0, ASR Findings and Section 2.4, ASR Conclusions and Recommendations.

# **SITE SPECIFIC SAFETY AND HEALTH PLAN (SSHP)**

## **OE/CWM Archives Search Site Inspection Visit**

**Central Oregon Air to Air Gunnery Range**

**Lake County, Oregon**

**Site #F100R017000**

### **1. REFERENCES:**

- a. Safety Manual, CELMS-PM-M, 16 Sep 93 w/ Ch1.
- b. SOP for Reporting Ordnance and Unexploded Ordnance (UXO), CELMS-PM-M, 19 Jan 95.
- c. OEW Guidance Regarding Coordination with EOD Organizations, 10 Jan 95.

**2. GENERAL:** This plan prescribes the safety and health requirements for team activities and operations conducted to determine the presence of ordnance and explosive waste and /or chemical warfare materials at the specified site.

- a. The Safety Officer has final authority on all matters relating to safety. The safety rules will be followed at all times. Any member of the team may stop operations if they observe a situation or activity which poses a potential hazard to any individual or to the operation. All actions must comply with the common sense rule!
- b. All team members will be aware of the local emergency numbers and the location of the nearest telephone.
- c. A minimum of two and a maximum of eight persons will be allowed on-site at any one time.
- d. The property owner is not required to sign the SSHP, but should be politely asked to participate in the safety briefing.

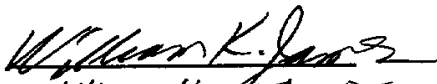
**3. MISSION:** Reconnoiter, document, and photograph areas on Central Oregon Air to Air Gunnery Range suspected to be contaminated with UXO and/or toxic chemical munitions. The range is located west of US Highway 395, north and east of state highway 31 and south of Lake County Road. Investigation will consist of the entire range.

10. SAFETY STATEMENT: Safety is everyone's business. No unnecessary risks will be taken to obtain photos or other data. Team members are responsible for notifying the project Manager or safety Officer of any physical conditions that may impede or prevent their accomplishment of the mission. An example is allergic reactions to bee stings.

#### Important Phone Numbers

Emergencies:	911
Lake County Emergency Services:	(503) 947-6012
Lake County Sheriffs Office:	(503) 947-6027
Lake County Hospital	(503) 947-2114
Huntsville Safety:	(205) 895-1582/1579
	(800) 627-3532, PIN 777-2534
Cellular Phone (Gilmore):	(314) 630-5814
St Louis Corps of Engineers:	(314) 331-8036
548th EODCT	(206) 967-1971

SSHP reviewed by:

  
William K. JAMES

Encls

1. Safety Briefing Attendance
2. Safety gear

MANDATORY MINIMUM SAFETY GEAR

First aid kit (individual)

\_\_\_\_\_✓

Survival kit

\_\_\_\_\_✓

Fire starter

\_\_\_\_\_✓

Space blanket

\_\_\_\_\_✓

Whistle

\_\_\_\_\_✓

Mirror

\_\_\_\_\_✓

Cellular phone

\_\_\_\_\_✓

Flash light

\_\_\_\_\_✓

Survey tape

\_\_\_\_\_✓

Canteen

\_\_\_\_\_✓

**APPENDIX M**  
**REPORT DISTRIBUTION LIST**

ORDNANCE AND EXPLOSIVE WASTE  
CHEMICAL WARFARE MATERIALS  
ARCHIVES SEARCH REPORT  
CONCLUSIONS AND RECOMMENDATIONS  
FOR  
CENTRAL OREGON AIR TO AIR  
GUNNERY RANGE MILITARY RESERVATION  
Lake County, Oregon

Project Number F10OR017001

APPENDIX C -- REPORT DISTRIBUTION LIST

<u>Addressee</u>	<u>No. Copies</u>
Commander, U.S. Army Engineer Division Huntsville, ATTN: CEHND-ED-SY-A P.O. Box 1600 Huntsville, Alabama 35807-4301	2
Commander, U.S. Army Chemical Materiel Destruction Agency Attn: SFIL-NSM, Bldg. E4585 Aberdeen Proving Ground, MD 21010	1
Commander, U.S. Army Chemical & Biological Defense Command Attn: AMSCB-CIH, Bldg. E5183 Aberdeen Proving Ground, MD 21010-5423	1
U.S. Army Technical Center for Explosives Safety Attn: SMCAC-ESM Savanna, IL 61074-9639	1
Commander, U.S. Army District, Portland Attn: CENPP-PE-DC P.O. Box 2946 Portland, OR 97208-2946	1
CELMS-ED-G	1
CELMS-ED-H	1
CELMS-PD-A	1
CELMS-PM-M	1

## **REPORT PLATES**

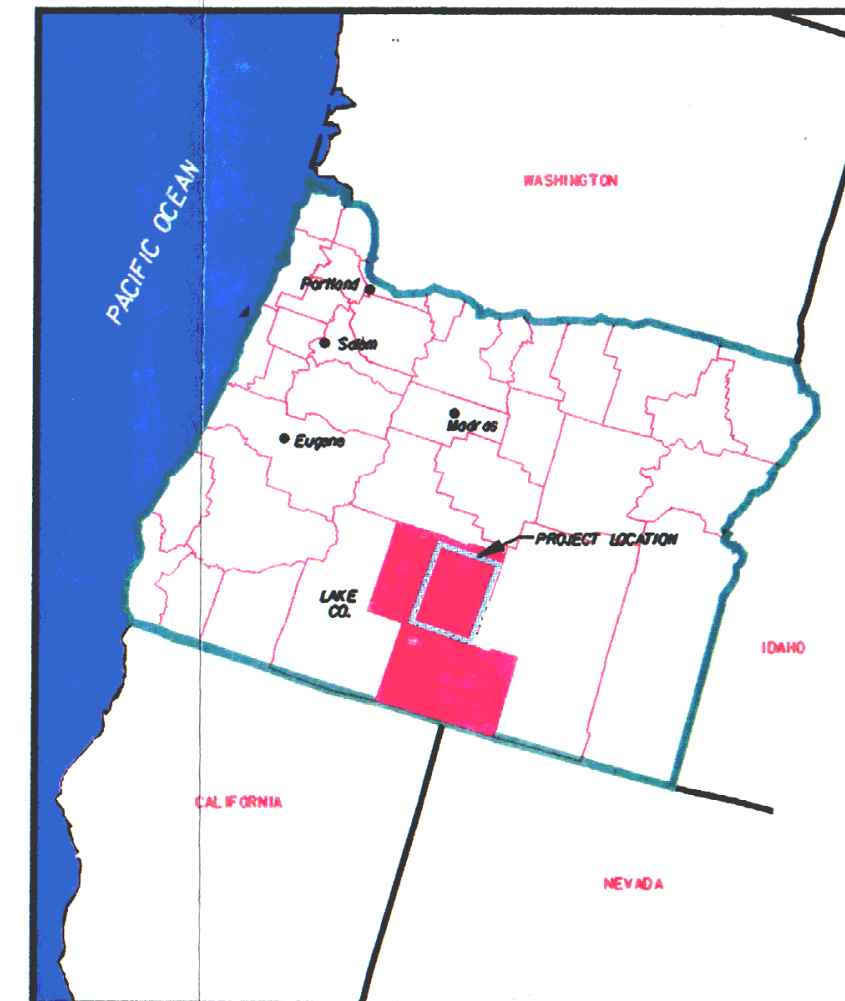
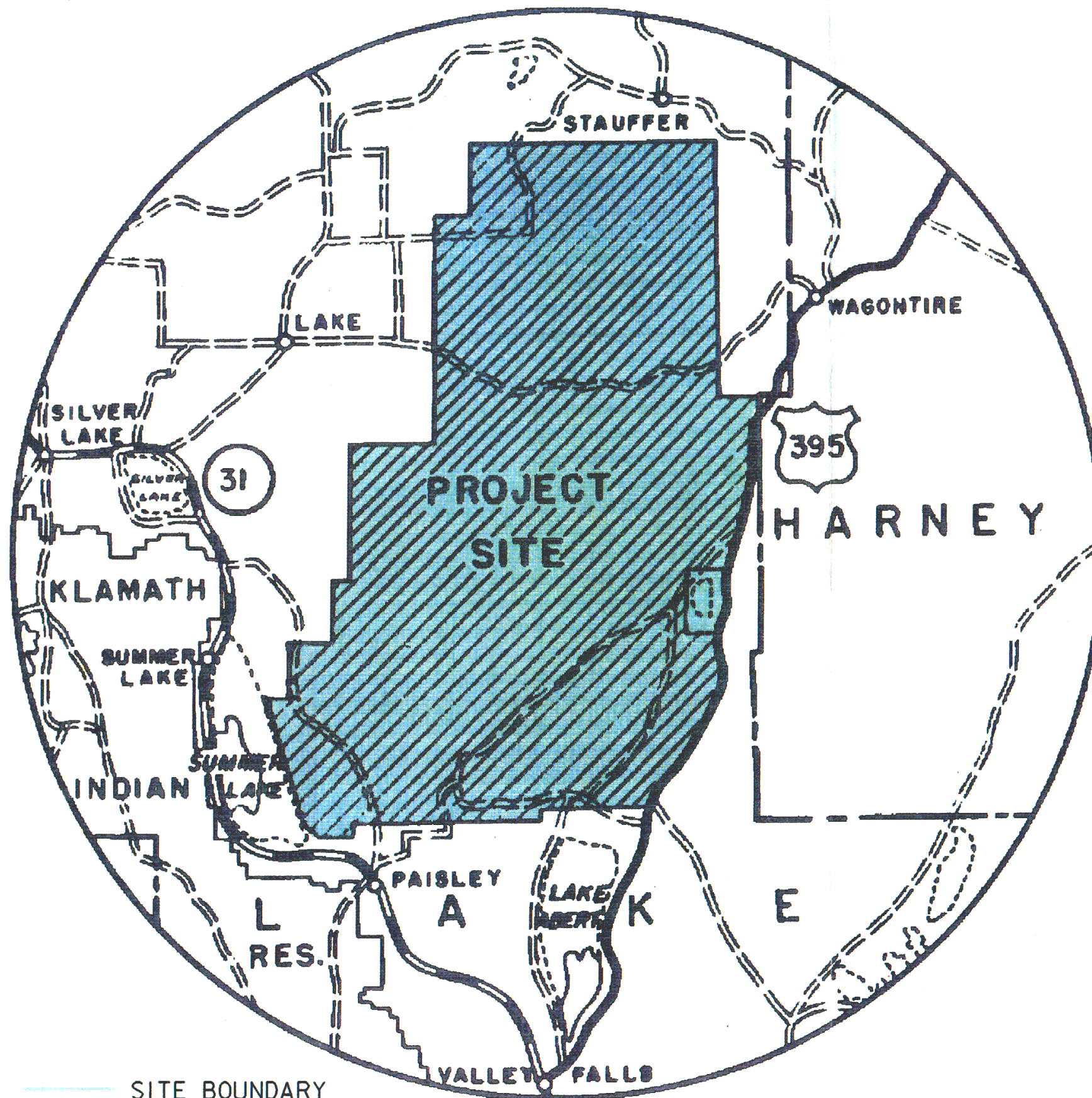
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Lake County, Oregon**

**Project Number F10OR017001**

**REPORT PLATES**

RP-1	Vicinity Map
RP-2	Findings





NOT TO SCALE

RP-1

CENTRAL OREGON AIR TO AIR  
GUNNERY RANGE  
LAKE COUNTY, OREGON  
DERP-FUDS# F100R017001  
VICINITY MAP

PROJ. DATE: JUN 1995

DATE OF MAP: 1993

6-JUN-1995 11:03

/N/0EW95C/G20/MAP/CENTVIC.DGN & .EXT



